

**NEW BESPOKE WASTE INSTALLATION ENVIRONMENTAL
PERMIT APPLICATION FOR THE ANAEROBIC DIGESTION
FACILITY**

at

**BRYN QUARRY, GELLIARGWELLT FARM, GELLIGAER
ROAD, GELLIGAER, CAERPHILLY**

MANAGEMENT SYSTEM

Prepared for:

BRYN POWER LIMITED

Part of the



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1 INTRODUCTION

This Management System document is to support an Environmental Permit application for Bryn Power Ltd to operate a new anaerobic Digestion facility (AD) at Bryn Quarry, Gelligaer.

The Management System includes as part of the system a Hazard Analysis Critical Control Point (HACCP) which is a requirement under the Animal By-Products Regulation 2005 (ABPR 2005). This element (the HACCP) describes in detail the control of the process in relation to the requirements of the Animal Health and Veterinary Laboratories Agency (AHVLA) and forms an integral part of the Management System.

The Management System relates to the use of the site for the receipt and treatment of food waste from kerbside and commercial sources together with cattle slurry, poultry litter and energy crops. The resultant biogas from the AD process will be stored in the AD tanks before being burned in a combined heat and power engine (CHP) to produce electricity and heat. The digestate will be separated into liquid and solid fractions. The solid fraction will either be used directly on land or added to one of the composting processes. The liquid fraction will be stored in the HDPE lined and covered leachate storage lagoon before being used on land as a biofertiliser. The digestate produced by the AD will meet the requirements of PAS:110 and the Anaerobic Digestion Quality Protocol (ADQP).

This Management System sets out the nature of the site, relevant site and infrastructure works, methods of operation and environmental control.

1.2 The anaerobic digestion process

The digesting material flows around the diameter of the 'plug flow' outer ring, completing a full revolution before entering the central tank, ensuring no feedstock 'short-circuiting' and providing optimal feedstock retention times. This allows the anaerobic digestion process to occur in full and is one of the crucial advantages of the SPF over conventional CSTR digesters.

Biogas generated as a product of the process is collected in the gas holder. A proportion of the biogas is recirculated throughout the digester to uniformly agitate the contents to prevent stratification, 'dead zones' and the build-up of a floating layer. The gas mixing system optimises biogas production and is integral to the outstanding performance of the SPF digester.

The digester is maintained at a constant temperature of 37-42°C (depending upon feedstock composition) by the circulation of hot water through an internal heat exchanger. The hot water for the heat exchanger is provided by the CHP unit during normal operating conditions.

Included within the digester is de-grit pipework, liquid level control, digester temperature control and gas holder level control.

Digested material is discharged from the centre of the Primary Digester, at the point furthest from where it entered, into the Pasteurisation Tank.

The pasteurisation process is a fully automatic batch process. The tank is filled from the primary digester until it is full; the tank is heated to a temperature of 72°C; when it reaches

this temperature the contents are held for a minimum period of one hour before being discharged into the Secondary Digester.

Digested material is discharged from the centre of the Secondary Digester into the Separator.

The design of the system is such that it is capable of establishing and maintaining the AD process on a continual 24 hours/day, 365 days/year basis.

1.3 Site location

The site is located east of the A470 which connects Cardiff with Merthyr Tydfil, approximately 20km northwest of Newport. Access to the site is via the site access road off Gelliagaer Road. The facility is located at Gelliargwellt Farm and is adjacent to a waste transfer station and in-vessel composting facility, owned and operated by Bryn Group Ltd.

The Bryn Group site also contains a permitted waste transfer station and in-vessel composting facility (IVC). The Bryn Group also operates a working sandstone quarry and is seeking an EP for an inert landfill site in order to backfill and restore the fully excavated quarry.

1.4 Site infrastructure

Drawing reference BPL-EPA-2015-MS-001 shows the location of the site in relation to the other operations run by the Bryn Group. The layout of the proposed AD site together with the proposed environmental permit boundary is shown on drawing reference BCL-EPA-2015-MS-002.

2 OPERATIONAL OVERVIEW

2.1 Waste Management Operations

The waste management operations at the site comprise the treatment of organic wastes by anaerobic digestion and combustion of the resultant biogas to produce heat and electricity. The details of the engineering development, method of operation and environmental pollution control are given in Sections 3, 4 and 5 of this document. The activities to be carried out will involve Waste Recovery and Waste Storage, being designated as R3 and R13 respectively. In addition, waste storage and transfer activities for food segregated wastes, designated D15 are incorporated. The limitations on specified waste operations are illustrates in Table 1.

Table 1 Waste Activities and Operational Limits

Specified Waste Management Operation	Permitted Waste Category	Limits on Specified Waste Operation
R13 Storage of waste materials to be subject to category R1, R3 and D10 operations.	All food wastes	i) The total quantity of waste accepted at the site shall not exceed 35,000 tonnes a year. ii) There shall be no storage of solid food waste at the site iii) Use of an auxiliary flare only where required for short periods of breakdown or maintenance of the facility. iv)
R3 Recycling or reclamation of organic substances which are not used as solvents.		
R1 Use principally as a fuel or other means to generate energy		

2.2 Permitted Waste

Waste shall only be accepted if it is a type and quantity specified in the Permitted list of wastes, and if it conforms to the description in the documentation supplied by the producer and holder.

See Appendix A for full list of accepted wastes. Any wastes that are not categorised in Appendix A should be considered contrary/non-conforming and dealt with appropriately. There shall only be non-hazardous wastes accepted the AD site.

Total annual quantities of accepted waste will not exceed 35,000 tonnes per annum of food waste.

2.2.1 AD System Inputs

The system maintains a continuous 24 hours per day, 7 days per week digestion operation subject to the filling of the liquid and solid feedstock storage vessels. The feedstock input regime (i.e. quantity and frequency of feedstock transfer) will be designed to optimise the AD process and complement the existing site operation.

2.2.2 AD System Outputs

The digestion of feedstock generates biogas as a product of the AD process. The AD process will be established to generate the optimum quantity of biogas, which will be collected and used as the fuel source for operation of the engine in the CHP Plant and the biogas boiler.

Digestate will be discharged from the Secondary Digester on a daily basis to a separator to remove the bulk of the dry matter. The separated liquor is piped away to storage. The fibre discharged from the screen will be typically 27% dry matter content and discharged onto a concrete pad or into a trailer or skip located below the separator.

2.3 Hours of Operation

As specified by Planning Permission APP/K6920/A/12/2173007

Table 2 Site Operational Hours

	Waste Acceptance	Maintenance
Monday to Friday	07:30 - 18:00	As required
Saturday	07:30 - 13:00	As required
Sunday	Emergency only	As required
Bank Holidays	Emergency only	As required

2.4 Staffing

The operator shall ensure that sufficient personnel, who are suitably trained and competent, are present to manage and operate the on-site recycling/treatment activities safely and without causing pollution. Personnel must be fully familiar with the requirements of the Permit as is relevant to their specific duties. Personnel shall have clearly defined roles and responsibilities.

Personnel	Number
Management	1
Administration	1
Operators	1
Other	0
<u>TOTAL</u>	<u>4</u>

The site is operated under the ultimate control of the Managing Director Mr Alun Price, but day to day responsibility rests with the Site Manager, Mrs Jennifer Morgan. The facility will require 1 employee shared with the adjacent IVC facility who will be supported when required by those employed in the adjacent existing waste and quarrying operations. Staff numbers will be maintained at a level sufficient to operate and supervise the site effectively and throughout periods of employee sickness and holidays.

2.5 Technical Competence

The manager and operatives will be appropriately trained and will be conversant with the requirements of the Environmental Permit and Management System, with particular regard to:

- Waste acceptance/rejection procedures;
- Operational controls;
- Maintenance procedures;
- Record keeping;
- Emergency action plan; and
- Notification to the Environment Agency and other regulatory authorities.

A copy of the Environmental Permit and Management System will be kept at the site office and will be readily available for reference by site staff, other company staff, Natural Resources Wales and other regulatory authorities.

A designated person will hold a suitable qualification in order to operate the site compliantly (see Table 3). The suitably qualified person's actual attendance hours on site will be recorded in the Site Diary.

Table 3 Technical Competence Qualifications

Name	Qualification
Alun Price	WAMITAB COTC Level 4
Jenifer Morgan	WAMITAB COTC Level 4

Any changes in technically competent management at the site, and/or the name of any incoming personnel, together with any evidence that such personnel has required technical competence, shall be submitted to the Natural Resources Wales within 5 working days of change in management. No site operations shall take place unless there is sufficient, trained and competent staff on site.

2.6 Site Sign/Notice (Identification Board)

In conformance with permitting regulations and the Management System, the operator shall display a clear, all-weather, easily readable Site Notice at or near the entrance to the site.

The Site Sign/Notice shall contain the following information:

- i) Company Name
- ii) Permit Holder's Name
- iii) Emergency Contact Name
- iv) Permit Holder's Telephone Number
- v) Statement that the site is permitted by the Natural Resources Wales (NRW)
- vi) The Permit Number
- vii) NRW National Numbers
- viii) Any other NRW Telephone Number required

The Identification Board shall be inspected at least once per week. In the event of damage or defect, the board shall be repaired or replaced within three working days.

2.7 Site Security

The facility lies within a substantial farm unit which is controlled by the family of the operator. The complex includes other waste related activities and stone quarrying, all of which rely generally on the farm security fencing and gates to limit vehicular access.

The nature of the AD site is such that specific control on access is required and as a consequence certain additional measures are necessary.

The site itself is demarcated for operational and HACCP reasons by an internal barrier to control circulation of wastes, equipment, vehicles and personnel between the lower level AD facility, the upper level concrete surface working area and the adjacent in-vessel composting facility. The site is bounded to the east by the IVC facility, whilst the remainder is secured with a stock-proof fence.

The internal access road is separately fenced to prevent cross-over of vehicles from the other activities and to control stock movements within the remaining farm complex.

The two parallel access roads which connect this activity and the existing operations within the complex are gated at the site entrance from the highway and these gates are locked outside all normal operating hours.

The boundary fences to the application site and gate from the internal access are checked on a regular basis for damage or signs of attempted entry. Such occurrences are entered in the site diary and any damage is repaired at the earliest opportunity.

All visitors will be required to sign in at the Site Office on arrival and exiting the site.

2.8 Relevant Convictions

In the unlikely event of the Permit Holder or a relevant person being convicted of any relevant offence, the full details will be provided to the Natural Resources Wales within 14 days of the conviction, as will be details of any appeals.

2.9 Change of Operator's or Holders Details

The following information shall be notified in writing within 5 working days to NRW:

- Any change to the Permit holders trading name;
- Any steps taken with a view to the Permit holder going to administration; and
- Any change in the operators trading name, address registered name or registered office address.

2.10 Maintenance of Financial Provision

The Company (Bryn Power Ltd) will make financial provision to meet the obligations of the Permit.

2.11 Notification of Preparatory Works

Commencement of preparatory works for the construction of the site and infrastructure and its completion will be notified to NRW in writing.

Any additional preparatory works required as a result of the issuing of a new waste Environmental Permit or site improvement would be notified to NRW or relevant authority. The Permit holder shall give no less than 7 days prior notice of any changes to the Management System.

2.12 Commencement or Cessation of Waste Operations

Commencement of anaerobic digestion operations on the site will be notified to the relevant authority in writing in advance.

In the event of any future cessation and subsequent re-commencement of the use of the site for in-vessel composting operations, the relevant authorities would be notified in writing specifying the date of any such cessation or re-commencement.

2.13 Notifications and submissions to NRW

Except where otherwise specified all submissions to NRW shall be in writing. These correspondences shall include the reference number and the name of the Permit holder.

3 SITE ENGINEERING

3.1 Reception Area

The AD facility will make use of the existing Waste Transfer Station infrastructure in terms of the reception compound's weighbridge facilities with computerised transaction records. The adjacent IVC houses the control office, which incorporates a mess- room, toilet/shower block.

A car parking area will be provided for staff and visitors' cars/vans, and there will also be sufficient space reserved for the temporary storage or quarantine of a vehicle whose load of waste has been deemed unacceptable for composting.

The reception of solid food waste will take place solely within the adjacent IVC building under the IVC's environmental permit. Liquid food waste will be fed directly into the ABP or non-ABP buffer tanks.

The compound facilities will be kept in a good state of repair. The external condition of the tanks and other site components will be visually inspected on a daily basis. Any damage found will be reported to the competent manager and repairs carried out as soon as practicable and definitely within 14 working days. The results of the inspections and remedial works will be recorded in the Site Diary.

3.2 AD Infrastructure

The AD facility will comprise:

- 3200m³ Semi-Plug Flow (SPF) Primary Digester
- 3200m³ Secondary Digester
- 500m³ Non-Animal By-Product (ABP) Liquids Buffer Tank
- 300m³ Sealed Buffer Tank (for ABP feedstocks)
- Non-ABP Solids Feed system
- 100m³ ABP Pasteurisation Tank
- Combined Heat and Power (CHP) Unit
- Surplus Gas Burner
- Separator & Belt Dryer
- 38m³ Post-Separator Buffer Tank
- Control Building and Control System

3.2.1 Semi-plug flow (SPF) primary digester

The primary digester will be 25m in diameter and 8m high and comprise an outer and inner tank. The working volume for the tank is 3,200m³. The 'Trifusion' glass-fused steel SPF digester has a fixed roof around the outer ring and a flexible membrane roof in the centre which acts as biogas storage.

The gas holder will consist of a double-membrane fabricated from PVC-coated polyester fabric. The outer membrane is permanently inflated by means of a 1.5kW air blower, to maintain a positive pressure on the inner membrane. A pressure relief valve maintains the pressure at 12mbar. The pressure on the inner membrane is sufficient to supply gas to the gas booster unit prior to its supply to the CHP unit.

The inner membrane provides containment for the biogas, and inflates or deflates according to biogas production and demand. A level controller is installed to control the operation of the CHP unit, boiler and gas mixing system.

The fixed roof includes a gas pressure/vacuum relief valve and an emergency liquid relief valve.

3.2.2 Secondary digester

The secondary digester will have a working volume of 3,200m³. The purpose of the secondary digester is to provide buffer storage and to allow secondary digestion of the digestate to ensure that all biogas is captured and that maximum stability of the system is achieved.

The 'Trifusion' glass-fused steel digester has a flexible membrane roof which acts as biogas storage. The gas holder will consist of a double-membrane fabricated from PVC-coated polyester fabric. The outer membrane is permanently inflated by means of a 1.5kW air blower, to maintain a positive pressure on the inner membrane. A pressure relief valve maintains the pressure at 12mbar. The pressure on the inner membrane is sufficient to supply gas to the gas booster unit prior to its supply to the CHP unit.

The inner membrane provides containment for the biogas, and inflates or deflates according to biogas production and demand. A level controller is installed to control the operation of the CHP unit, boiler and gas mixing system.

The contents of the Secondary Digester Tank are mixed by re-circulating biogas and digester contents through a system of stainless steel pipework and nozzles.

The secondary digester tank is constructed on a reinforced concrete base which slopes to a central discharge point. Digestate is discharged from the base centre by a lobe-pump.

3.2.3 Non-Animal By-Product (ABP) Liquids Buffer Tank

Non-ABP liquid feedstocks and/or recirculated digestate are transferred to a 500m³ 'Tri-fusion' glass-fused steel buffer tank. The buffer tank is fitted with a mechanical mixer, to homogenise the contents, and an access ladder. The material is pumped into the feed line via a macerator to prevent any large objects entering the digester. The liquids buffer tank is fitted with a GRP roof and carbon filter.

3.2.4 Sealed Buffer Tank (for ABP feedstocks)

The 300m³ capacity buffer storage tank is fabricated in 'Tri-fusion' glass coated steel panels and includes a fixed sealed roof connected to the biogas system to collect gas generated in the tank and to prevent emissions of gas to atmosphere. The roof includes a gas pressure/vacuum relief valve.

The buffer storage tank is constructed on a reinforced concrete base which slopes to a central discharge point. The buffer storage tank is mixed by the recirculation of biogas through nozzles cast into the base of the tank.

The gas is circulated by independent mixing systems, each comprising a gas compressor which pumps the gas through an 18-port rotary valve which sequences the circulated gas through each nozzle in turn.

Digester feedstock is discharged from the buffer storage via an in-line macerator which reduces particle size to a maximum of 12mm by a lobe-pump. The discharge from this tank is at an invert level above floor level. This enables collected grit to be collected from the central discharge hopper, which is manually operated once per week into a manual screen.

3.2.5 Non-ABP Solids Feed system

Non-ABP solid feedstocks are delivered to a bulk feeder/mixer hopper fitted with weigh cells to enable the plant operator to load the correct quantity of feed. The bulk feeder mixes the feedstock via three vertical augers and cuts up any long fibres before discharging into a solids feeder. The feeder's twin horizontal augers further chop the solid feedstock and combine with liquid feedstock (or recirculated liquid digestate) to produce pumpable 'slurry'. The 'slurry' is pumped into the digester via a macerator which reduces the particle size to a maximum 20mm, presenting a greater surface area for bacterial activity to take place and ensuring efficient digestion.

The solids feeder will be capable of feeding on a batch basis to achieve suitable feed rates. The process control allows for accurate measurement of feedstock into the digester at intervals predetermined to maintain optimum gas production.

3.2.6 ABP Pasteurisation Tank

The pasteurisation tank has 100m³ capacity. The tank is fabricated in 'Tri-fusion' glass coated steel panels and includes a fixed sealed roof which is connected to the biogas system. The roof includes a gas pressure/vacuum relief valve.

The pasteurisation tank is constructed on a reinforced concrete base which slopes to a central discharge point. The tank is insulated with 100mm of mineral wool protected with plastic-coated steel sheets. The insulation ensures that the heat within the system is retained.

The pasteurisation tank is mixed by the recirculation of biogas through 18 nozzles cast into the base of the tank. The gas is circulated by a mixing system comprising a gas compressor which pumps the gas through an 18-port rotary valve which sequences the circulated gas through each nozzle in turn.

The pasteurisation tank is heated by the circulation of its contents through an external concentric-tube heat exchanger. The digestate is circulated through the heat exchanger by a lobe-pump. Hot water is circulated through the heat exchanger by a centrifugal pump.

Pasteurised digestate is discharged from the base centre of the pasteurisation tank by a lobe-pump.

3.2.7 Combined Heat and Power (CHP) Unit

During normal plant operation biogas will be utilised by the CHP unit to generate electricity and heat. A 499kWe CHP unit has been specified to accommodate the proposed level of biogas production.

Two standby boilers are installed in order to provide the process heat for the digestion and pasteurisation when the CHP unit is being maintained. The heat is transferred from the boilers by centrifugal water pumps.

3.2.8 Surplus Gas Burner

In the event that the boiler is also shut down the biogas will be diverted to an Environment Agency-Compliant High Temperature Non-Visible Surplus Gas Burner with a throughput capacity of 500m³/hr to prevent an overpressure situation arising within the gas holder and to ensure no unburned gas is released to the atmosphere.

3.2.9 Separator & belt dryer

A vertical separator is specified which has been designed to deal with lower dry matter wastes. The separator will be situated between the belt dryer and silage clamp. A conveyor will transport digestate fibre into the dryer on demand or into the building.

Surplus heat from the process will be utilised to a containerised 400kW belt dryer. Dried material will be augered into the silage clamp.

3.2.10 Post-Separator Buffer Tank

Open-topped 'Tri-fusion' glass-fused steel buffer tank with a 38m³ capacity. The tank provides buffer for liquid digestate storage prior to pumping to lagoon.

3.2.11 Control Building and Control System

The operation of the biogas plant is fully automated from an on-site central Control Panel which monitors information transmitted from field instrumentation around the plant. The Control Panel and HMI/SCADA system for the purposes of this proposal are situated in a control building connected to the digester. This building will also house the biogas boilers and heating circuit header.

The system provider provides a remote monitoring service via an internet connection so that changes can be made and advice given to ensure optimisation of the AD process. The system also allows Bryn Power to monitor the site remotely.

An inline continuous gas monitor is installed. The analyser transmits signals to the HMI to enable real-time monitoring of CH₄, CO₂ and H₂S. These signals are used to regulate air that is injected into the roof space to aid the growth of sulphur reducing bacteria on the large surface area of the fixed outer tank roof and sulphur net suspended between the liquid level and the gas membrane across the central tank.

The operator HMI station will consist of a computer terminal running a graphical interface of several pages. The pages will show the running status of the plant and provide control screens from where items of plant and variables can be manually controlled by the operator. The terminal will also record data for display in historical trends and have provision for presenting the data as a report or a graphical representation.

3.3 Drainage and Containment System

The site partly comprises an area of filled ground together with a parcel of farmland all of which has been profiled and levelled to accommodate the building and infrastructures required.

In order to provide sufficient emergency storage in the event of AD tank failure and for storm water the ground level for the AD tank working area is approximately 2m below the level of the existing adjacent concrete slab. All AD tanks that will hold liquid will be sited on this reduced level. A silage clamp holding dried digestate and feedstock crops will be constructed on the extended concrete pad to the south of the tanks.

The containment system for the lower level working platform has been designed in accordance with CIRIA guidance “C736D - Containment systems for the prevention of pollution: Secondary, tertiary and other measures for industrial and commercial premises” dated 2014’.

Currently the surface water from the site either drains to ground or runs into the unnamed stream to the south east of the site. It is proposed that all surface water collected in the reduced level area is held until such time that the quality of the water is assessed and the water is allowed to drain into the adjacent stream. All surface water runoff from the existing and proposed concrete lab will be directed through interceptors before being discharged into the unnamed stream to the south of the site.

The pipework carrying feedstocks from the IVC and farm slurry tanks together with the pipework running from the separator to the leachate storage lagoon and the pipe carrying the food waste ‘soup’ produced by the de-packaging unit on the IVC will be fully welded HDPE pipes laid in clay lined trenches.

All roads will be maintained in a satisfactory condition by means of monthly inspections to check their physical state and the early implementation of repair works when deemed necessary. The results of the inspections and remedial works will be recorded in the Site Diary.

4 SITE OPERATIONS

4.1 Pre-Acceptance

Personnel shall ensure that the site has the required number of qualified staff on site prior to the waste acceptance and rejection procedures. Personnel shall ensure that the site has capacity to store and treat any incoming waste.

Personnel shall ensure that the site will not exceed Permit conditions by accepting any incoming wastes. Wastes should not be accepted at the installation without a clear method or defined treatment and recovery/disposal route.

4.2 Waste Acceptance

All incoming vehicles will enter via the existing waste facility site entrance and weigh in at the input weighbridge. Documentation will be checked by the weighbridge operative, to ensure that the waste complies with the waste types permitted by the Planning Permission, Permit and ABPR Regulations 2005 or any subsequent updates. The relevant documentation includes Carriers Certificate of Registration and Duty of Care Waste Transfer Note, which will be signed by the weigh-bridge operative to confirm the acceptance/receipt of the waste prior to the driver being allowed to proceed to the Compost site.

Vehicles depositing material will proceed to the reception hall, vehicle collecting compost product will proceed to the screening area or product storage bays. Each vehicle will be re-weighed at the exit weighbridge prior to leaving the site. Weighbridge data will be stored on computer for record and invoicing purposes. For any waste arriving on site, a record is kept of:

- Date and time of waste delivered;
- Type of waste;
- Weight of load;
- Duty of care transfer note;
- Vehicle registration number; and
- Haulier and waste carrier registration number.

All waste delivered to the compost facility will be inspected visually at the compost reception area upon being unloaded to check that it complies with the categories of waste specified in the Licence. Vehicles entering or depositing ABPR controlled material will be subject to additional control measures as defined in the ABP Regulations.

4.3 Waste Rejection

In the unlikely event that it is found necessary to refuse to accept a particular load for disposal, a standard rejection procedure will be implemented. The waste rejection procedure to be complied with will be:

- A hard standing holding or quarantine area will be incorporated into the waste reception hall. For loads which are rejected prior to deposit, the driver will be instructed to park the vehicle as an interim measure for closer inspection. The competent manager and weighbridge will be contacted by radio prior to the rejected materials being removed from the site and, if appropriate, the weighbridge ticket and billing rate amended.

- For loads which are rejected following deposit, the unsuitable materials or the whole load depending upon the degree of contamination will be isolated. Subsequent actions will be dependent upon the reason for rejection and would be similar to those outlined above.
- In the event that the waste material should be determined to be Hazardous Waste then the relevant consignment notification form will be prepared, in conjunction with the haulier or producer and the material will be transported to an appropriate treatment or disposal site.

4.4 Waste Contamination

As part of the normal composting process it is anticipated that there will be some materials unsuitable for composting (contraries e.g. plastic bags and rubble) in the incoming loads and the majority of these contraries will be removed by the site operatives before the waste is processed.

4.5 Waste Dispatch

All contraries will be stored in a secure area and their weights and other particulars recorded prior to transporting from the site to a suitably permitted facility. All wastes shall be inspected prior to dispatch to confirm their description and composition.

4.6 Waste Measurements

The quantities of all waste input and outgoing compost product will be measured by means of the waste facility's weighbridges. Electronic records will be made of the loaded and unloaded weight of each vehicle (in tonnes), together with the nature and composition of each load. These weighbridges will be subject to regular maintenance and calibration checks. The weighbridge shall have an accuracy of 0.01 tonnes.

If a short-term failure of a weighbridge is experienced, then second weighbridge on the facility will be utilised.

5 POLLUTION CONTROL

5.1 Plant Maintenance

The site operates a strict maintenance regime and equipment used is of sufficient capacity to allow down time for routine maintenance and servicing as recommended by the manufacturer.

No plant may be operated unless full instructions and training have been given by a person competent to do so. Movement of equipment within the in-vessel area is strictly controlled with recorded cleaning between areas.

No plant or equipment may be worked on for maintenance purposes unless it has been removed from the site and has been isolated to prevent an accidental start, only in exceptional circumstances which prevent its removal, shall work be undertaken on any item of plant within the site.

Any newly arrived or hired in equipment is subject to particular scrutiny to ensure it meets the standards required by both the company and current legislation.

All breakdowns or incidents involving plant or equipment are entered in the site diary.

5.2 Meteorological Monitoring

Meteorological conditions are monitored at the site. The unit provides a continuous record (every 15 minutes) of wind speed, wind direction, rainfall, barometric pressure and temperature with these parameters being noted on a daily schedule. The weather station downloads data to the site computer.

The purpose of monitoring the meteorological conditions is to provide weather data which could be of immediate use for managing the day to day operational activities. The wind direction data is useful in scheduling operations to assure prevailing wind conditions will not impact on sensitive receptors. The rainfall data is of value in predicting the impact on the leachate holding tank capacity and the likely need for pumping off surplus leachate.

The weather station is serviced at regular intervals and a service report filed in the site office.

5.3 Dust

All wastes, except when being transferred between treatment operations, are kept within closed systems within a sealed building or tank until such time as the composting process is largely completed.

As a consequence incidents of dust or particulate release are remote. The site diary is used to record any incidents of dust emissions have been noted and the reasons for it.

5.4 Mud and Debris

The entire working area is surfaced by impermeable concrete or hard-standing. All wastes and composting process take place on impermeable surfacing with sealed drainage.

Any vehicle leaving the site will be checked to ensure that they are clear of loose material and that waste is secure. Where necessary, vehicles will be cleaned before leaving site.

In the event that mud or debris is deposited onto public areas, by action or inaction, that material will be cleaned as soon as practicable and cause of mud/debris escape investigated and remediated.

5.5 Litter

Waste accepted on site has been pre-segregated at source reducing the risk of contamination from litter. Very little litter is expected within incoming waste, but where present it will be immediately removed to sealed refuse containers, prior to disposal.

Regular checks are made within and around the site for litter which may escape during the waste transfer process between the waste reception building and the composting vessels. The area around the reception building will be kept clean and tidy.

Any materials found will be removed and returned to the waste reception building or stored within the non-permitted waste containers, depending on the nature and origins of the litter.

5.6 Pests

The site has adequate pest control provisions and monitoring to ensure pest and vermin levels remain low. These are checked on a weekly basis and a specialist contractor will carry out independent inspections at least 12 times per year. If an infestation should ever be found, then appropriate pest control measures will be immediately implemented. The results of the inspections and any remedial action will be recorded in the Site Diary.

5.7 Spillages

All spillages will be dealt with immediately. All vehicles, plant and equipment used on site will be operated and maintained with the objective preventing environmentally harmful leaks and spills.

In the event of any potentially environmentally harmful leaks or spillages, documented control and remediation procedures will be implemented immediately and recorded.

Any liquid contrary wastes will be immediately isolated and made ready for further disposal. Incidence of liquid contrary wastes will be recorded in the Site Diary. See Waste Acceptance procedures.

A spillage kit is available on-site (in main office) for rapid clean-up and amelioration of spills.

5.8 Noise and Vibration

Emissions from the activities shall be free from noise and vibration levels likely to cause pollution outside the site.

Suitable measures will be implemented and maintained throughout the operational life of the site to ensure noise emanating from the site is minimised.

All equipment used at the site will be appropriately silenced and the shredder and screening equipment will be noise attenuated. All vehicles, equipment and plant will be switched off when not in use. All vehicles, equipment and plant will be maintained with a clear intention to reduce noise and vibration levels.

Any noise monitoring carried out and remedial action taken will be recorded in the Site Diary and will be reported to the Natural Resources Wales.

Waste processing operations will only be carried out during the designated hours as stated in Table 1.

5.9 Storage of Wastes

All storage and treatment of waste solids, liquids and sludges shall not be within the following distances:

- 10 metres of any watercourse;
- 50 metres from any spring or well, or from any borehole not used to supply water for domestic or food production purposes; and
- 250 metres from any borehole used to supply water for domestic or food production purposes.

All wastes shall be stored and processed on an impermeable surface with a sealed drainage system. Wastes shall be stored or treated within enclosed containers, reactor vessels or enclosed well ventilated buildings fitted with a biofilter and/or scrubbing system. The biofilter is specifically designed to minimise the release of odour, bioaerosols and microorganisms and maintained for the process undertaken and be fit for purpose.

6 ACCIDENT MANAGEMENT

The site has implemented a full Accident Management Plan detailing potential accident and emergency situations that could occur on site, control measures to minimise potential occurrence and procedures should accidents occur on site.

6.2 Potential Accidents

Identified potential accidents include:

- Plant or equipment failure
- Fire
- Severe Weather
- Arson/Vandalism

7 MONITORING AND RECORDS

7.1 Monitoring

The operator shall undertake the monitoring as show in Table 4. The operator shall maintain records of all the monitoring required, including records of the taking and analysis of samples, instrument, measurements, calibrations, examinations, tests and surveys and any assessments or evaluations made on the basis of such data.

Table 4 Site Monitoring Requirements

Parameter	Measurement	Purpose and limits	Frequency
CH ₄ , CO ₂ & H ₂ S	Inline continuous gas monitor	Used to regulate air that is injected into the roof space to aid the growth of sulphur reducing bacteria on the large surface area of the fixed outer tank roof and sulphur net suspended between the liquid level and the gas membrane across the central tank	Continuous
Liquid level and temperature with each tank	In-built instrumentation	To monitor and control the tank contents.	Continuous
• Oxides of Nitrogen • Carbon monoxide • Suphur dioxide • Total volatile organic compounds including methane	Monitoring carried out by suitably accredited organisation	To monitor the emissions from the stacks on the engines. • 500 mg/m³ • 1400 mg/m³ • 350 mg/m³ • 1000 mg/m³ Emission levels at Normal Temperature and Pressure and 5%O₂, unless otherwise agreed in writing by the Agency Uncertainty allowance as stated in EA guidance LFTGN08 v2 2010. To ensure effective plume breakaway, minimum stack gas exit velocity shall be no less than 15 m/s or the gas exit temperature shall be no less than of 200°C	Annual
Stacks on boilers burning biogas	Oxides of Nitrogen	No limit set	None specified

Parameter	Measurement	Purpose and limits	Frequency
Auxiliary flare	Oxides of Nitrogen	No limit set	Record of operating hours
Pressure relief valves	Biogas	No limit set	Weekly visual or remote monitoring to ensure valves is correctly seated.
Odour	Sniff test.	Identify any release of odour from composting operations.	Daily

7.2 Site Diary

A Site Diary shall be maintained, and retained in the site office. It shall record visitors, non-routine activities and other incidents. The Site Diary should be checked periodically by the Permit Holder to ensure its correct use. The Site Diary shall be readily available for inspection. Examples of activities recorded in the site diary include:

- Names of operators and times of attendance on site.
- Names and times of technically competent managers on site.
- Names of visitors on site.
- Any accidents resulting in injury.
- Operational details of individual windrows
- Any incident of fire.
- Any incident of spillage.
- Any incidents causing pollution to the environment, harm to human health or detriment to the amenities of the locality.
- Any machinery breakdown.
- Any deposit of unsuitable waste at the site.
- Condition of site infrastructure and engineering.
- Incidence of litter, dust, pest, odour and noise problems.
- Leachate pumping.
- Results of various inspections for litter, odour, noise, birds, pests etc.
- Natural Resources Wales licence inspection reports.

7.3 Waste Records

Records of all waste entering and the leaving the site shall be recorded. All records will be made as soon as reasonably practicable and retained securely for a minimum of two years. Records will be clear, legible and available for viewing (on site). Records must be kept of all incoming wastes, and all outgoing compost, compost-like material and residuals.

The following records will be retained (not comprehensive):

- Waste Carriers Licences (where appropriate).
- Weighbridge Tickets/Documents* – incoming wastes.
- Bioaerosols monitoring.
- Weighbridge Tickets/Documents* – outgoing wastes (including residual wastes).
- Destination of outgoing wastes (including market sector).
- Destination of outgoing compost like material.
- Reject Waste Forms.
- Natural Resources Wales Inspection Reports.
- Design, construction, inspection, maintenance and monitoring of pollution prevention methods.
- Failure records for pollution prevention methods.
- Off-site environmental effects.
- Records of sampling.
- Records of corrective actions taken during composting processes.
- Type of input material, whether the load is rejected or accepted, and if rejected the reason why.
- Product Preparation Information.
- Duty of Care Records.
- Quarterly Waste Returns.

*should include Date and Time.

7.4 Reporting and Notification

Site personnel will notify the Natural Resources Wales “without delay” following the detection of:

- Any malfunction, breakdown or failure of equipment or techniques, accident, or fugitive emission which has caused, is causing or may cause significant pollution.
- The breach of a limit specified in the Permit.
- Any significant adverse environmental and health effects. Site personnel will notify the Natural Resources Wales within 24 hours:
- Of actual or potential incidents and breaches of emissions limits. Site personnel will notify the Natural Resources Wales within 14 days:
- Where the Natural Resources Wales has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling.
- Of any change in the operator’s trading name, registered names or registered offices addresses.

During normal working hours site personnel will contact the Site Officer or the local NRW Office by telephone. The Environment Agency National Incident Hotline number is: 0800 807 060.

7.5 Training Records

Each person, whose duties affect compost quality shall be trained, instructed and supervised commensurate with those duties, such that he/she is competent. Training records for personnel who affect site procedures, operations and quality shall be maintained.

7.6 Site Waste Returns

Quarterly returns shall be provided and stored at the site office in line with Environment Agency regulations.

7.7 Complaints

The operator shall decide and implement any necessary action in response to any complaints or concerns expressed by interested parties, including operatives, customers, clients and regulatory authorities about quality or usability of any compost or compost based products.

The operator shall record the:

- Name and contact details of the person who expressed concern or made a complaint;
- Specific subject(s) of the concern or complaint;
- Date and time communicated to the producer and name of the person to whom it was communicated;
- Nature and date(s) of any actions and checks and who carried them out;
- Nature and date of any response to the person who expressed a concern or made the complaint; and
- Name of the person who communicated the response.

APPENDIX A

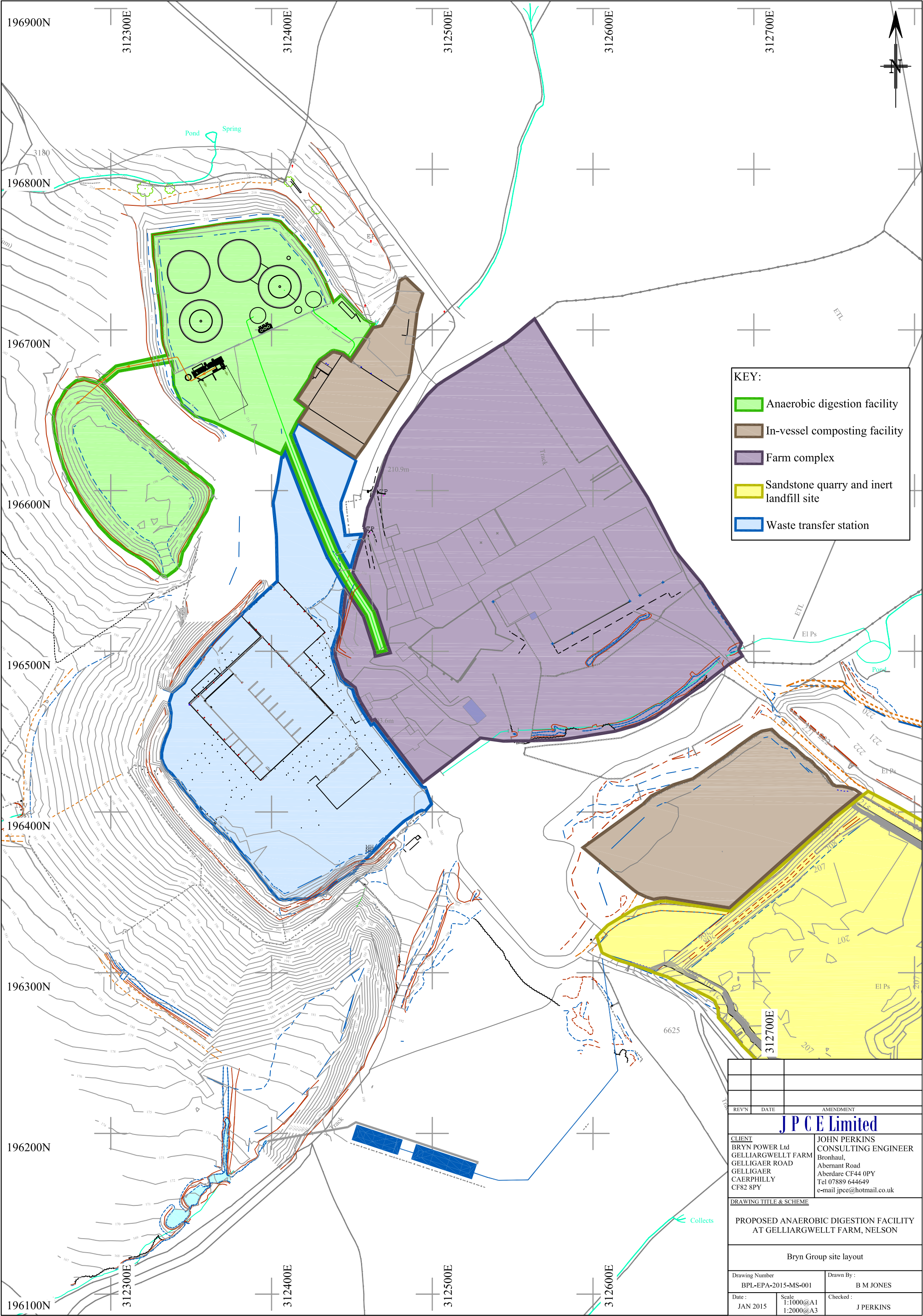
PERMITTED WASTES

Waste Codes	Description
02	WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING
02 01	wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
02 01 01	sludges from washing and cleaning – food processing waste, food washing waste
02 01 02	animal tissue waste including blood, animal flesh, fish processing waste, fish carcasses, poultry waste
02 01 03	plant tissue waste including husks, cereal dust, waste animal feeds, off-cuts from vegetable and fruit and other vegetation waste
02 01 06	animal faeces, urine, manure including spoiled straw
02 01 07	wastes from forestry
02 01 99	residues from commercial mushroom cultivation
02 02	wastes from the preparation and processing of meat, fish and other foods of animal origin
02 02 01	sludges from washing and cleaning, process water, food washing waste
02 02 02	animal tissue waste including blood, animal flesh, fish processing waste, fish carcasses, poultry waste
02 02 03	materials unsuitable for consumption or processing
02 02 04	sludges from on-site effluent treatment
02 02 99	sludges from gelatine production, animal gut contents
02 03	wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
02 03 01	sludges from washing, cleaning peeling, centrifuging and separation
02 03 04	materials unsuitable for consumption or processing
02 03 05	sludges from on-site effluent treatment
02 03 99	sludge from production of edible fats and oils to include seasoning residues, molasses residues, residues from production of potato, corn or rice starch
02 04	wastes from sugar processing
02 04 03	sludges from on-site effluent treatment
02 04 99	other wastes
02 05	wastes from the dairy products industry
02 05 01	materials unsuitable for consumption or processing including solid and liquid dairy products, milk, food processing wastes, yoghurt, whey
02 05 02	sludges from on-site effluent treatment
02 06	wastes from the baking and confectionery industry
02 06 01	materials unsuitable for consumption or processing including food condemned, food processing wastes, biscuits, chocolate, yeast, bread, bakery wastes
02 06 03	sludges from on-site effluent treatment
02 07	wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)
02 07 01	wastes from washing, cleaning and mechanical reduction of raw materials including brewing waste, food processing waste, fermentation waste
02 07 02	wastes from spirits distillation including spent grains, fruit and potato pulp, sludge from distilleries
02 07 04	materials unsuitable for consumption or processing including brewing waste, food processing waste, fermentation waste, beer, alcoholic drinks, fruit juice
02 07 05	sludges from on-site effluent treatment

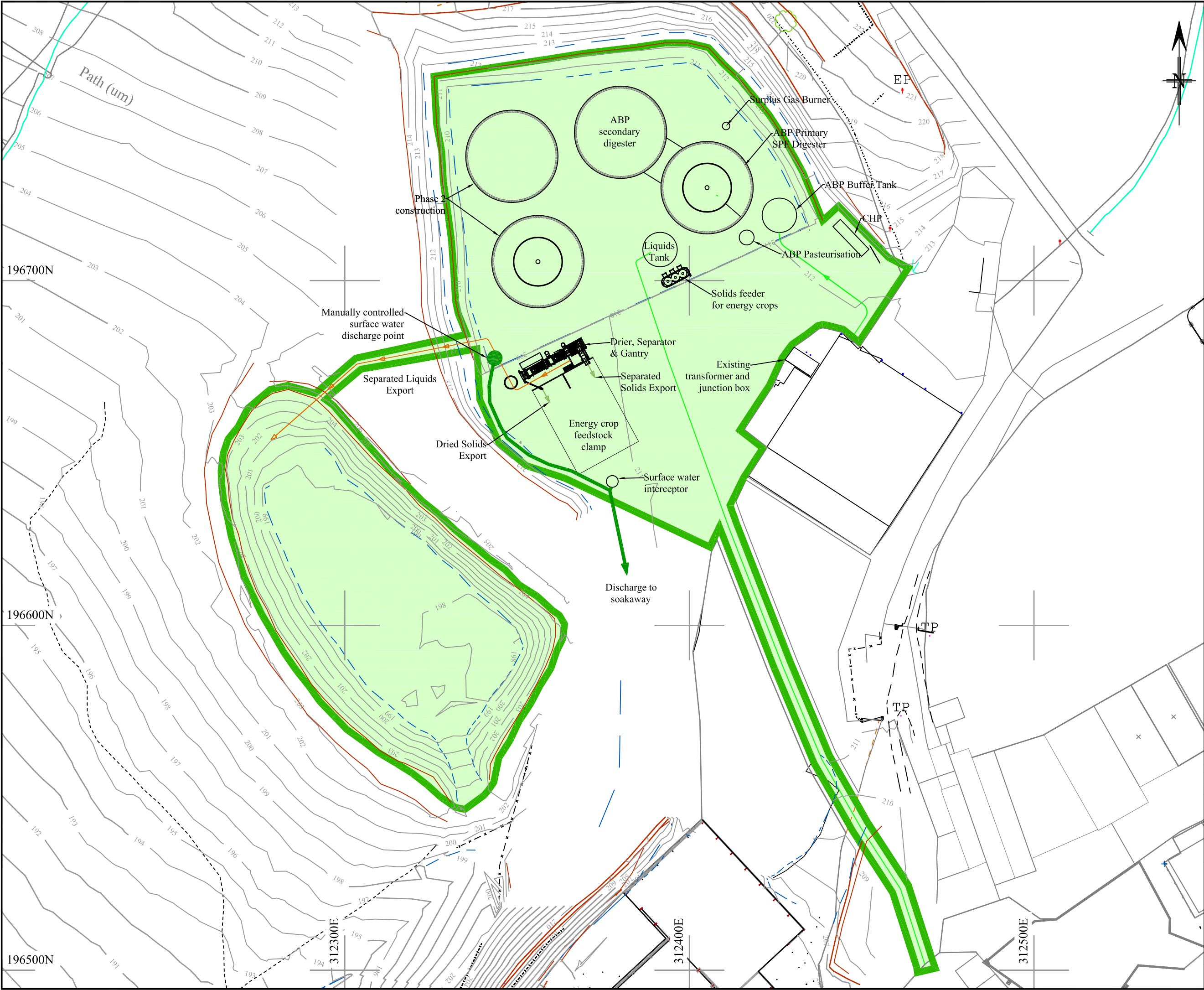
Waste Codes	Description
02 07 99	spent grains, hops and whisky filter sheets/ cloths, yeast and yeast like residues, sludge from production process.
03	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD
03 03	wastes from pulp, paper and cardboard production and processing
03 03 02	green liquor sludge
03 03 08	paper and cardboard - not allowed if any non biodegradable coating or preserving substance present.
03 03 10	fibre rejects and sludges i.e. paper pulp (de-inked only), paper fibre
04	WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES
04 01	Wastes from the leather and fur industry
04 01 01	fleshings and lime split wastes
04 01 05	tanning liquor free of chromium
04 01 07	sludges not containing chromium
04 02	waste from the textile industry
04 02 10	organic matter from natural products, e.g. grease, wax
07	WASTES FROM ORGANIC CHEMICAL PROCESSES
07 01	wastes from the manufacture, formulation, supply and use of basic organic chemicals
07 01 08	glycerol
15	WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED
15 01	waste packaging, absorbents, filter materials, wiping cloths and protective clothing
15 01 01	paper and cardboard packaging – not allowed if any non biodegradable coating or preserving substance present. Excludes laminates such as Tetrapaks.
15 01 02	Biodegradable plastic packaging - must be independently certified to BS EN 13432
15 01 03	Untreated wooden packaging– not allowed if any non biodegradable coating or preserving substance present.
15 01 05	composite packaging - must conform to BS EN 13432 and not allowed if any non biodegradable coating or preserving substance present.
19	WASTE FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE
19 02	wastes from physiochemical treatments of waste
19 02 03	waste types listed within this table, Table 2.3, that have been mixed together only
19 02 06	sludge types from waste listed within this table, Table 2.3, that have been heat treated only
19 02 10	glycerol not designated as hazardous i.e excludes EWC code 19 02 08
19 05	wastes from the aerobic treatment of solid wastes
19 05 01	non composted fraction of municipal and similar wastes
19 05 02	non composted fraction of animal and vegetable wastes
19 05 03	off-specification compost from source segregated biodegradable waste
19 05 99	composting liquors
19 06	waste from anaerobic treatment of waste
19 06 03	liquor from anaerobic treatment of municipal waste
19 06 04	digestate from anaerobic treatment of source segregated biodegradable waste
19 06 05	liquor from anaerobic treatment of animal and vegetable waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste
19 08	wastes from wastewater treatment works
19 08 09	grease and oil mixture containing only edible oils and fats
19 08 12	sludge from industrial biological treatment

Waste Codes	Description
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 12	waste types listed within this table, Table 2.3, that have been subjected to mechanical treatment only
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
20 01	municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions
20 01 01	paper and cardboard– not allowed if any non biodegradable coating or preserving substance present. Excludes laminates such as Tetrapaks
20 01 08	kitchen and canteen waste
20 01 25	edible oil and fat
20 01 38	Untreated wood where no non-biodegradable coating or preserving substance present
20 02	garden and park wastes (including cemetery waste)
20 02 01	biodegradable waste
20 03	other municipal wastes
20 03 01	mixed municipal waste – separately collected biowastes
20 03 02	wastes from markets, allowed only if source segregated biodegradable fractions e.g. plant material, fruit and vegetables.

DRAWINGS



REV'N	DATE	AMENDMENT
J P C E Limited		
CLIENT BRYN POWER Ltd GELLIARGWELLT FARM GELLIGAER ROAD GELLIGAER CAERPHILLY CF82 8PY		JOHN PERKINS CONSULTING ENGINEER Bronhaul, Abernart Road Aberdare CF44 0PY Tel 07889 644649 e-mail jpce@hotmail.co.uk
DRAWING TITLE & SCHEME		
PROPOSED ANAEROBIC DIGESTION FACILITY AT GELLIARGWELLT FARM, NELSON		
Bryn Group site layout		
Drawing Number BPL-EPA-2015-MS-001		Drawn By : B M JONES
Date : JAN 2015	Scale 1:1000@A1 1:2000@A3	Checked : J PERKINS



KEY:
 Proposed Environmental Permit site boundary

REV'N	DATE	AMENDMENT

J P C E Limited

CLIENT
BRYN POWER Ltd
GELLIARGWELT FARM
GELLIGAER ROAD
GELLIGAER
CAERPHILLY
CF82 8PY

**JOHN PERKINS
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Bronhaul,
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DRAWING TITLE & SCHEME
PROPOSED ANAEROBIC DIGESTION FACILITY AT GELLIARGWELT FARM, NELSON
Proposed anaerobic digestion facility site layout and environmental permit boundary

Drawing Number
BPL-EPA-2015-MS-002

Drawn By :
J PERKINS

Date :
FEB 2015

Scale
1:500@A3

Checked :